BULLETIN

of the

ONTARIO COLLEGE OF PHARMACY

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H. J. Fuller, Editor

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The Ontario College of Pharmacy is the pharmaceutical licensing body for the Province of Ontario, Canada. All pharmacists licensed in Ontario are *IPSO FACTO* members of the College.

The majority of contributors to the Bulletin are members of the Faculty of Pharmacy, University of Toronto. However, contributions are welcomed from all members of the College.

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W. S. LUTON.

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BIOGRAPHY OF P. T. MOISLEY

President O.C.P., 1949-1951

P. T. Moisley

The theme of the triphasic career of Mr. P. T. Moisley, one of the most prominent figures in Canadian Pharmacy to-day, is "PROGRESS".

Mr. Moisley was born on November 18th, 1899, in Fenwick, a small town in Southern Ontario. He received his elementary school education in Fenwick and his secondary school education at both Smithville and Welland High Schools. While in his last year at Welland High School Mr. Moisley was confronted with a decision which was to influence the entire course of his life. He had seen an advertisement placed on the High School bulletin board, requesting summer help in a Pharmacy, owned by a Mr. George Collins. He decided rather than go home that summer he would apply for this position. In the succeeding months his interest in the mysteries of Pharmacy increased so that eventually he decided to make Pharmacy his profession.

He began his apprenticeship under Mr. Collins, but was interrupted by the advent of World War I, at which time he entered the Royal Air Force, and served in this corps for six months. Later, he returned to complete his apprenticeship with his preceptor, and then entered the Ontario College of Pharmacy. While attending College Mr. Moisley met Chip Ball, and a life-long friendship developed.

In June, 1922, P. T. Moisley entered the employ of J. R. Todd in South Porcupine. During the following months he travelled back and forth between Todd's stores in South Porcupine and Schumacher. In October of that year he became manager of Mr. Todd's new store in Timmins, and remained there, in that capacity, until 1926 when he and Chip Ball purchased the concern and formed a partnership.

In 1948, Chip Ball, Mr. Moisley's close friend and business associate passed away.

A year later, the location of the store changed to a new one which was four times the size of the original. In 1952 the 25th anniversary of the Moisley & Ball Ltd. establishment was celebrated. Departmentalization has necessitated that the personnel of each department be well trained. In recent years Mr. Moisley has paid for the cost of this specialized training out of his own pocket. He has also completely paid for his employees' hospitalization policies. At the present time his Pharmacy is one of the most progressive and successful establishments in Northern Ontario.

The second phase of P. T. Moisley's triphasic career can be captioned under the heading of "Community Affairs", a phase in which he was quite active.

Mr. Moisley became president of the Kiwanis Club of Timmins in 1936, and then Lieutenant-Governor of the Northern Division—Ontario, Quebec, Maritimes District, of the Kiwanis International in 1937. He was always very interested in "Boys' Work", and for many years was in charge of the Trail Rangers and Tuxis groups at the First United Church. In the Second World War he founded the No. 10 squadron of the Timmins Kiwanis Club Air Cadets, and was the commanding officer for that unit until 1946.

Mr. P. T. Moisley's profound contribution to the Profession of Pharmacy began, when, in the summer of 1939 at his summer cottage, he received word that he had been nominated to represent District No. 10 on the Council of the Ontario College of Pharmacy. He was elected in that year to the seat on the Council, which he has held ever since.

He served on the Committee on Division and Infringement from 1939 to 1944, and in June of 1944 became Chairman of that committee. During the period 1945 to 1949 he served on the Committee on Education and Research, and worked with his colleagues in preparing for the inauguration of a four year course, in Pharmacy, the prototype of which he had seen during his visit to the University of Wisconsin. P. T. Moisley was Vice-President of the Ontario College of Pharmacy from 1947 to 1949, and then became President, a position which he held until 1951. He has been the Canadian Pharmaceutical Association delegate from Ontario since 1948.

Since then, Mr. Moisley has been active on other committees such as The Special Planning Committee, 1948-1949. In 1950, he served on the Committee on University Contract, was Chairman of a Committee on Physician-Pharmacist Relations.

At the Canadian Pharmaceutical Association Convention in 1951, in Calgary, Mr. Moisley presented a report on the Study of Pharmaceutical History. In the same year he worked on the Committee of Finance and Property. In 1952, while on the same Committee, he took part on a Special Committee on Negotiations with the University of Toronto. He also became Chairman of the By-Laws Committee and Historical Committee of the Canadian Pharmaceutical Association. He was elected Second Vice-President of the Canadian Pharmaceutical Association in 1953, but in addition still retained his positions on the Committee of Finance and Property, and Education and Research Committee, for the College.

In the following year, Mr. Moisley became First Vice-President of the Canadian Pharmaceutical Association. In 1955, he became the President of the Canadian Pharmaceutical Association, and is still serving on the Committee of Education and Research. He was also named President of the newly formed, Canadian Academy for the History of Pharmacy. The purpose of this group is "To provide Historical Information Service for the Pharmaceutical Profession and Industry—To Inform the Public about the Development of Pharmacy".

Mr. P. T. Moisley, as it can easily be seen, has contributed much of his time and effort to Pharmacy. In 1949, as President of the College he said, "What we are trying to do is to elevate the standards of Pharmacy generally, and put it on a sound basis". To-day we see that he is responsible for that and much more, as can be evidenced by his great concern for the education of future pharmacists.

Mr. Moisley has shown great versatility in his accomplishments which have varied from the operation of a very successful business in Northern Ontario, to Community Efforts, and finally to his many contributions to the Pharmaceutical profession in Ontario, and then of Canada.

In a recent address to an Association he concluded with, "Pharmacy is on the March, are YOU in Step?" This statement made by Mr. Moisley seems to summarize his idea of "Progress" with respect to the practice of Pharmacy.

Mr. Moisley became Registrar-Treasurer of the Ontario College of Pharmacy on March 1, 1959.

ALLAN FERGUS.

PRELIMINARY PROGRAM FOR INSTITUTE IN HOSPITAL PHARMACY

Held by the Canadian Society of Hospital Pharmacists Ontario Branch

(1) Greetings.
(2) Panel—"How Has The Ontario Hospital Care Program Affected Hospital Pharmacy?"
(3) The Canadian Commission On Accreditation Views the Pharmacy and Therapeutics Committee and the Formulary System.
(4) Formulas for a Formulary.
(5) One or two papers on Pharmacology and Therapeutics.
(6) Luncheon.
(7) Practical Manufacturing in the Hospital Pharmacy.
(8) Control Procedures for Manufacturing in a Hospital.
(9) Workshops.
(10) Branch meeting in the evening.

To be held at the Ontario College of Pharmacy, on Saturday, May 2, 1959.

THE CANADIAN PHARMACEUTICAL ASSOCIATION 17th ANNUAL SURVEY

In the past the Canadian Pharmaceutical Association Annual Survey of Retail Pharmacy Operations has made history. It is usually commented on in both the English and American pharmaceutical press.

The survey provides pharmacists with goals to achieve and guideposts to follow. The Questionnaire for the 1958 Survey has been mailed to you. The larger the number of replies we receive the more accurate will be the guideposts.

READY TO BUY LAND FOR INSTITUTE

With well over one third of its $300,000 objective already pledged, a suitable site is being sought upon which to erect the Canadian Institute of Pharmacy.

"The campaign is really rolling", commented J. C. Turnbull, secretary of the National Committee headed by J. G. Richard of Montreal. "Pharmacists across Canada and individuals in industry are contributing generously to this, the greatest undertaking in our history. We have now reached the point where we are looking for land".

The national secretary also announced that "final financial plans" will be contemplated "in the next few months". Upsurge of interest in a "new home for Pharmacy" in recent months—especially throughout the Province of Ontario—he said indicated a growing awareness for a permanent headquarters where pharmacists from every province could meet and discuss their problems.

It is expected preliminary plans will be prepared in the near future. Basically, the new building will be an administrative centre with facilities for conference purposes as well. However, since it is designed to be available "for all Pharmacy's activities and groups", it will also require other facilities, e.g., foyer, lounge, library, museum, drug display. The museum and display would be open to the public.

"What will be available in the new building", Mr. Turnbull pointed out, "of course will depend on the number of dollars available".

The campaign is under sponsorship of the Canadian Pharmaceutical Association. Because of the unique position it occupies and essential service it provides, it was considered as "the logical body to undertake the creation of a new Pharmacy Centre—the Canadian Institute of Pharmacy—where under one roof, all activities of the profession can share common facilities if they so desire".

The Institute will enhance the prestige of the profession. With facilities available to press and public, it will kindle new interest in Pharmacy as a career—strengthen interprofessional relations. It will serve as a lasting memorial to Pharmacy's great contribution to Canada's national health and welfare.

C.Ph.A., too, will benefit immeasurably by being in its own home. Having adequate "elbow room" will enable this national organization to expand existing services and provide greater assistance for its members in Ontario and all parts of Canada. Present facilities render such growth impossible.

The Institute will belong to the pharmacists of Canada. It will be their "permanent home". It will serve as the "front door" of the profession—a dignified approach to a profession destined to play an increasingly more important role as a member of Canada's health team in the future. Every pharmacist in Canada stands to benefit in some degree through realization of this cherished dream of a Canadian Institute of Pharmacy.

The Bulletin of the Ontario College of Pharmacy has regular readers in the United States, England, the Philippines, Australia, Bulgaria, Sweden, India, Thailand, Holland, Cuba, Jamaica, and Puerto Rico.

A TESTIMONIAL TO H. M. CORBETT

Registrar-Treasurer of the Ontario College of Pharmacy
May 1, 1943 to March 1, 1959

H. M. Corbett

On a blustery March day in 1943 the Council of the Ontario College of Pharmacy met in special session to select from the applicants a new Registrar-Treasurer for the College. No College Council of this or any other era made a better or wiser decision, that day, than the selection of Mr. H. Milton Corbett.

To-day, sixteen years later, on his retirement from office, we, the pharmacists of Ontario, wish to express in some small measure our recognition and appreciation for the outstanding manner in which he has looked after our interests in the intervening time.

During his term of office he has demonstrated qualities such as few men possess. His devotion to the demands of the office and his overwhelming desire that the office of Registrar be of the utmost service to his fellow pharmacists demanded of him all his thoughts and energy.

Wise management and natural thrift have enabled him to maintain and protect the College assets during difficult times, both when income was low and when large gifts had been made by Council to others. Pride in Pharmacy as a profession, and vision and faith in the destiny it could fulfill, if only all would work for its best interests, were part of his everyday thinking. With this, however, he had tolerance for those who either through stupidity or self-interest sought to destroy it.

To the student and young person bothered by personal problems, and there have been many during the years, he was known as a wise and sympathetic counsellor. What they could not know was that he often mulled over their concerns at great length looking for a solution. A constant cheerful and charitable spirit had been his daily companion, enabling him to bear with the many frustrations and the ever present human cussedness that bedevil a position of this kind. The outstanding integrity and fairness with which all were treated endeared him to all who dealt with him.

When Mr. Corbett took office, the Ontario College of Pharmacy was a small, self-contained private college. He leaves it as an important faculty of a great university. These changes, which have been the most advanced and exciting in any comparable period in all the history of Pharmacy in Ontario, were in large part smoothly and suc-

cessfully accomplished with a minimum of friction due to his energetic and diplomatic handling.

We would, therefore, as Pharmacists, be remiss on his retirement if we did not express our gratitude and respect for the superlative manner in which Mr. Corbett has served us.

What of the future? With Milt's active and enquiring mind each minute will be filled with sixty seconds of interesting pursuits, which he has long denied himself in his devotion to Pharmacy. Our wish is that they will be most rewarding?

Here is, "A man of courage, a man of sense, a man of letters, a true fine gentleman, such as one seldom sees".

W. S. LUTON.

HERE'S WHAT THE NEW YORK TIMES THINKS OF PHARMACISTS

(The New York Times, the nation's most influential newspaper, published the following editorial in its issue of Monday, January 26th, 1959.)

Congratulations should go to the Pharmaceutical Society of New York for its sponsorship of a bill in the State Senate that is designed to protect both the public and the pharmacists. The measure, introduced by Senator Earl W. Brydges, would tighten up the regulations on the sale and labelling of proprietary medicines, restrict sales to non-drug outlets and put on the pharmacist the responsibility of telling the customer if a given drug is potentially toxic or habit forming.

In a time when some drug stores have been turned into glorified five-and-tens, when patent medicines are peddled on TV and dispensed in the supermarkets it is a good thing to work toward the restoration of safety and sanity in the sale and purchase of remedies. This bill is designed, primarily, to protect the public. It hopes to cut down "blind" buying. But in so doing it can also protect the pharmacist and give him a new dignity and responsibility.

The good pharmacist is a trained technician. He is required to follow an arduous course of study before he can be qualified. He is also a good citizen because he helps to respect and enforce the law and to uphold the ethics of his profession. He needs help if he is to continue in those capacities.

The help that is offered consists chiefly in giving him a still further responsibility. Only qualified persons would be allowed to dispense drugs that are potentially dangerous. Such drugs must, under the law, be properly labelled. And on the pharmacists would devolve the responsibility of explaining to the customer exactly what the label involved and implied.

No good pharmacist expects or wants to replace the physician. But he can be of great help in supplementing the work that is done. He is not a pitchman for snake oil. He is a professional. He deserves what further dignity can be accorded and he will acquit himself with honour.

REPORT ON OPEN HOUSE

Now that Open House is over and the Pharmacy College has returned to an almost normal routine, one can reflect on what has taken place. Open House, an exposition of the many activities and pursuits of Pharmacy produced by the students of the Faculty of Pharmacy was a success.

The various branches of Pharmacy, hospital, manufacturing, retail and research were illustrated by demonstrations in various parts of the building. Students demonstrated and explained many of the courses offered to the interested spectators showing how these subjects are used in various branches of Pharmacy. Other aspects of Pharmacy explained were those of the Library and History, past and future. The future showed several architectural drawings of the proposed Canadian Institute of Pharmacy Building.

Special attention was given to high school students in the Vocational Guidance display. Graduate Pharmacists are to be commended not only for their attendance but also for providing transportation for high school students by bus or car, both from inside and outside Toronto, as far away as London.

The Pharmacists were interested to see the recent advancements and to renew acquaintances with the Faculty and classmates. Several manufacturers and many pharmaceutical associates contributed in different ways which helped to make Pharmacy 1959 Open House a success.

J. G. NAIRN.

RECEIVES DOCTOR OF PHILOSOPHY DEGREE

The degree of Doctor of Philosophy was conferred on J. G. Nairn, Assistant Professor of Pharmacy, Faculty of Pharmacy, University of Toronto, by the University of Buffalo, on February 23, 1959. Professor Nairn's thesis was on The Synthesis of Analogues of the Pyrimidine Moiety of Thiamine. Congratulations to Dr. J. G. Nairn.

SPECIAL ANNOUNCEMENT

The registrar has announced that Mr. Joseph Sedgwick, Q.C., has ben retained by Council to study and advise on all aspects of the Pharmacy Act.

RECENT GRADUATES — CIVIL DEFENCE

Word has been received from Mr. J. E. Matthews, Health Supplies Officer, Civil Defence Health Service, Ottawa, that copies of the new manual "Laboratory and Blood Techniques for Pharmacists in Civil Defence" are available to all previous pharmacy students who have taken the civil defence course at College. Graduates in this category who desire a manual should write directly to the Health Supplies Officer, Civil Defence Health Service, Department of National Health and Welfare, Ottawa.

DERMATOLOGICAL FORMULATIONS

Part I.

Dr. George C. Walker

"Dermatology is one the last outposts of extemporaneous compounding. Take away the "dermatologic prescription" and you take away one of the last fields in which a practicing professional pharmacist today is given an opportunity to exhibit his training and ability to render a fine pharmaceutical service to the patient, the dermatologist and, last but not least, to his own professional pride". So wrote Dr. Frederick D. Lascoff a short time ago (1). There is no question as to the validity of this statement. Dermatology as a medical specialization has come a long way within recent years—it has left behind much of the trial and error that characterized the early treatment regimes. There is, however, much yet to be done. As Dr. Polano states, (2) There are various reasons why in matters of therapeutics there is so little international agreement. The first is the fact that dermatotherapeutics as a science has not yet attained the same level as the other branches of dematology. This may be partly attributed to the fact that therapeutics, or materia medica, as a whole is a somewhat neglected part of our medical training programme, so that, in the first place, dermatotherapeutics share in the general therapeutics malaise. Then, there is the particular drawback that there is no animal known whose skin sufficiently resembles human skin to make pharmacological experiments on it of value. Thus the huge number of topical dermatotherapeutic agents has to be tested on the skin of our patients or of volunteers. The difficulties of this situation are apparent and, as a result, our knowledge of topical skin medication is in great part based on the "clinical experience" of more or less critical observers". "A very unsound foundation indeed". "A thorough knowledge of the properties of our therapeutic agents is indispensable for the advance of dermatotherapeutics. As a matter of fact, these properties are known almost exclusively to pharmacists who have only a scanty opportunity to use this knowledge as they are limited by the prescriptions of the physicians. Only close collaboration of pharmacist and physician permits extensive use of the possibilities, partly still hidden, in topical skin medication".

From these words of one of the world's outstanding dermatologists we should immediately grasp the great challenge presented to us — the opportunity to exercise to the maximum our professional knowledge and skill — to work closely with the physician in producing products that are "pharmaceutically elegant, stable, uniform and reproducible, and actually also "cosmetically elegant".

One important fact must be recognized at the outset — manufactured products, good as they may be, will not always meet the need, since the dermatological prescription is written for a specific skin disease, and the dermatologist generally desires certain ingredients, or combinations of ingredients, in special vehicles in order to satisfactorily treat the often highly sensitive and diseased area. Many of these diseases are admittedly treated now by a combination of internal as well as external therapy, but the fact still remains that by far the most effective method is that of topical medication. The very fact that it is topical brings the pharmacist into a particular focus since the vehicle must then be carefully selected in order to bring the drug of drugs into intimate contact with the skin. The vehicle itself may have a most beneficial action in addition to causing the patient no discomfort or interfering with his work or staining his clothing, and so on. We just cannot put out a malodorous, gritty, inelegant preparation today. The manufacturer spends months in attempting to find the best base for the drugs that will yield a most elegant preparation. There is yet another important premise — the physician, in prescribing for dermatological conditions, may prescribe any of the official formulas occurring in standard texts of reference, or perhaps a manufactured or proprietary preparation, but in so doing, he should know the exact content of each and every one of them. This is not always possible, and certainly not always desirable. The physician likes to write a prescription for the actual ingredients or drugs themselves with the realization that he is giving the patient the very best of his knowledge in that particular condition.

The pharmacist fits most naturally into this picture (3). He can advise as to the many types of preparations and formulas that are available — he is a specialist himself in the art and science of compounding — he knows the suspending agents of choice, the types of emulsions that are suited — the ointment bases — the surface-active agents — the colours, and many other pertinent facts. This knowledge can be of the greatest value to the physician and he must be advised that such is available to him at all times. Close co-operation and team work by both parties in a diversity of experimental formulations cannot help but achieve the desired purpose — the best treatment of the diseased condition, and the accumulation of valuable scientific information for future use.

General Considerations

Dermatological preparations include a variety of forms and types such as lotions, emulsions, suspensions, ointments, etc. with which we are all familiar, and each one is designed or selected for a particular purpose. As suggested previously, most of them are cosmetically elegant and indeed, the bases are often classified as cosmetics during health, and as dermatologic medication in disease when drugs are included. As time goes on, external therapy will be replaced more and more by internal medication, since the actual cause of many diseases are not known, and therefore, therapy is directed toward alleviation of the symptoms.

The major objectives of external therapy and the types of therapeutic agents used to reach these objectives are outlined by Frazier and Blank (4) as follows:

OBJECTIVES	AGENTS USED
1. Prevention or relief of	
a. Dryness	Emollients
b. Pruritus	Antipruritics
c. Excessive sebaceous secretion	Detergents
d. Excessive sweating	Detergents and antiperspirants
e. Pain	Wet dressings
2. Alteration of blood flow	
a. Vasodilatation	Wet dressings
b. Vasoconstriction	Wet dressings
3. Protection	Emollients and protectives
4. Removal of	
a. Keratinized epithelium	Detergents and keratolytics
b. Serous exudates	Wet dressings
5. Removal and killing of micro-organisms and parasites	Detergents and anti-infectives
6. Relief of eczematous inflammation	Anti-eczematous agents
7. Relief of inflammation in seborrheic areas	Antiseborrheic agents

The terminology is familiar to most of us but perhaps a brief review for reference might be desirable. Emollients are materials that soften or soothe the skin, or soothe an irritated internal surface. They may be referred to as demulcents and humectants. Antipruritics are substances or preparations that relieve itching. Antiperspirants are substances or preparations used in the treatment of excessive sweating of the hands, feet and axillae. A Protective is simply an agent that protects the skin, and various emollients may also serve as protectives. Anti-infectives, antiparasitics, antifungals and antiseptics are agents that act by destroying or inhibiting the growth of parasites and microorganism. Antieczematous is a term rather difficult to define (4). Frazier and Bland state that when one speaks of eczematous disease, he but redefines dermatitis with qualifications relating anatomically to the epidermis and etiologically, it would seem, to a state of hypersensitivity or allergy of the skin. Zopf(5) indicates that anti-eczematous agents may act in various ways—protective, keratolytic, antipruritic, cooling. Antiseborrheic is another term difficult to define(4). The designation antiseborrheic agent assumes a seborrheic condition. This is misleading as there is no flow of sebaceous material as the term suggests. Seborrhea of seborrheic dermatitis is but a scaly inflammation occurring in those areas of the integumentary surface given to oiliness. Astringents are materials that produce a local effect by the precipitation of protein. Keratolytics are agents that cause a separation or peeling of the horny layer of the epidermis. Keratoplastics are substances that tend to produce an increase in thickness of the horny layer of the skin, usually by mild stimulation and irritation. It should be noted here that keratoplasty also refers to plastic surgery of the cornea (corneal grafting). There are many other terms used

in connection with dermatology. It is very helpful to secure a copy of the Merck Manual and refer, with a good medical dictionary, to the section on "Skin and Connective Tissue"(6), since it would be impossible in a paper of this length to indicate the many facets concerned with skin diseases; nor would it be within our province; but a knowledge of disease types and terminology is indispensable to the practising pharmacist.

The skin is composed of two layers or strata: (1) a superficial layer of stratified squamous epithelium, and (2) a deep layer of connective. The outer layer is also called the cuticle and has two subdivisions, the epidermis and the Malpighian layer. Pigment granules are found in the epidermis. The deeper layer is called the derma, corium, or true skin. The corium is composed of interlacing bundles of fibrous and elastic tissue which gradually blend into the areolar subcutaneous tissue. Over most of the body the outer surface of the corium is folded in irregular ridges forming papillae with the deeper cell layers of the cuticle filling the spaces between the papillae. Embedded within the corium are the sweat glands, sebacous glands, and hair roots. Very small blood vessels, lymphatics, and nerve fibres have their endings in the corium. In the subcutaneous tissues small arteries form an arterial plexus from which small vessels pass into the corium and form another plexus under the papillae. The color of the skin varies with the amount of pigment in the cells of the epidermis and with the blood supply. The deeper layers of the skin contain many small blood vessels which, in health, give a pink tint to the skin. If the blood is poorly oxygenated, the resulting blue tint is known as cyanosis.

The skin varies in thickness, that covering the exposed areas of the face and hands being thicker than that on the areas protected by clothing. The soles of the feet are calloused, and the hands of a laborer are really horny in character. The protected skin surface of the inner side of the arms and legs is more delicate than that on the outer surface. Th skin of a person in poor health is usually dryer and more sensitive than that of a person in robust health. An invalid or an unconscious person may suffer a severe burn from a hot water bottle at a temperature which would not harm a well person. The skin of a hypothyroid individual (one having an under-active thyroid) is thick, dry and leathery. The skin of a hyperthyroid individual is warm, moist, and flushed. The skin is a delicate indicator of health and of encroachments on functional efficiency.

A small bundle of smooth muscle, the arrector pili, is attached to certain hair shafts. When their muscles contract, the hairs stand more nearly erect and the consequent small wrinkles of skin give the appearance known as "goose flesh".

Wherever there are hairs there are small glands which secrete sebum, an oily substance. In certain areas, particularly on the nose where the hairs are quite small, the sebaceous glands are large. If the outlets of a gland becomes blocked, a sebaceous cyst results.

The tarsal glands lying within the tarsus of each eyelid are modified sebaceous glands. These are also known as Meibomian glands and occasionally a Meibomian cyst occurs when the outlet of a gland is blocked. An infection of one of these produces a stye.

There are sweat or sudiferous glands distributed over the entire body; they are more abundant in the palm of the hand, the sole of the foot, and in the armpit than on the rest of the body surface. The sweat glands are an important part of the heat-regulating mechanism of the body.

The ceruminous glands of the external ear canal which secrete wax are modified susudiferous glands. The ciliary glands located in the eyelids behind the eyelashes are modified sweat glands (glands of Moll) (7).

Absorption, Penetration and Release of Medication

Studies on intact skin do not necessarily give information that may be interpreted in terms of pathological conditions and there are no techniques of investigation on animals that can be translated directly to refer to human skin. It would seem logical to apply lipid-soluble or miscible medicaments dissolved or dispersed in a fatty vehicle and water-soluble drugs or dispersible medicaments in an aqueous phase or medium, but there are no general principles to determine whether to employ oil or water as the external phase.(8)

The outer epidermis (9) is composed of stratified epithelium rich in lipids and esters of cholesterol. The superficial layer is horny, tough, and keratinized, and also presents a greasy surface which prevents or delays the penetration of water and aqueous solutions. The skin is electrically polarized and behaves like a membrane with a negative charge on the outside. It is cation permeable and anion permeable, and this is one explanation of the general impermeability of the skin to electrolytes, although in aqueous solution can be introduced by electrophoresis. But no systemic absorption results from penetration into the outer epidermis since it is avascular. The inner dermis is composed of a meshwork of fibrous and elastic tissue which is well supplied with blood vessels and merges into, and is continuous with, the underlying fat. The control of the flow of blood by the variation in tone of these blood vessels regulates surface temperature; also they serve as the nutritional vessels of the dermis and should a substance penetrate the outer epithelium it may be rapidly absorbed in the capillary bed. The skin then may be regarded as both lyophobic and lyophilic, and bathed in an aqueous secretion with certain pH characteristics and normally impermeable to "foreign" substances(8). It must be remembered however that any of these so-called normal features may alter under pathological conditions.

The greater part of percutaneous penetration takes place by way of the appendages of the skin—hair follicles and sebaceous and sweat glands — so that before penetration may take place, there is yet a further barrier to systemic absorption; this is the sebum, a secretion of glycerides and fatty acids(9).

The presentation of medicaments in ointments, creams or lotions may be considered from three aspects. Firstly, the liberation of the medicament from the base or vehicle; secondly, the penetration of the outer epidermis of the skin by the medicament; and thirdly, the absorption of the medicament into the bloodstream. Among the factors influencing penetration and absorption through the intact skin are the mode of application, the vehicle, the various physico-chemical

properties of the medicament, the base, dermal secretions such as sweat, sebum, tissue lipids, and the extracellular fluid. (9)

Penetration readily occurs through broken skin because the protective barrier of outer layers has been removed. Thus, local anesthetics are generally ineffective on intact skin although they will exert their normal action if the skin is broken or if the stratum corneum is removed.(8) Perhaps unbroken skin is a rarer state than we imagine; the modern concept of hygiene demands, in varying degree, the removal of sebum with detergents, and the abrasion of the skin with various foreign tissues.

Penetration and aborption studies have been made by many workers and using many different techniques. The passage of antigens, hormones, vitamins, anti-infectives, anti-rheumatics, alkaloids, and many other classes and types of compounds into and through the skin have been studied. The liberation of the medicament from the base or vehicle has been studied by a variety of methods, but Gemmell and Morrison, in their excellent review paper, conclude with this statement, "it would seem that a standard **in vitro** method of estimating the availability of the medicament is still required". The point of import in connection with release of medication may perhaps be illustrated by the following: Seelman demonstrated the importance of diffusion of a medicament very simply by placing moistened blue litmus paper on a slide covered with official boric acid ointment. The litmus was still blue after several hours, showing that no penetration or release of acid had occurred. This of course led to many of the modifications seen today where surface-active agents, emulsion bases, etc., are used to secure liberation of the medicament.

The wealth of information, and the diversity of views and experimental results, on this subject of penetration, absorption and release are very difficult to interpret and to summarize. Some useful concepts are presented by Cooper and Gunn:—(10) Paraffins do not readily penetrate the skin; animal and vegetable fats and oils do penetrate the skin; wool fat, especially when combined with water, penetrates the skin; emulsions, even of paraffins, penetrate the skin; absorption into the blood stream may be very largely a function of the medicament; oli-in-water emulsion bases release their contained medicament more readily than greasy bases or water-in-oil emulsion bases.

It should not be imagined that the efficiency of skin therapy depends on percutaneous absorption alone; the need is often for a purely superficial action, where protective or emollient properties are desired. It is also necessary to consider whether the spread of a preparation should be virtually unlimited or whether this should be confined strictly to the area to which it is deliberately applied(8). For example, dithranol is a useful therapeutic agent on psoriatic skin but it is harmful to normal skin; it is therefore normally dispensed as a relatively stiff ointment or paste. The opposite applies to any preparation for treating extensive areas of eczema, when it is helpful to employ a mobile fluid vehicle, that is, a lotion.

The relationship between the pH of the skin and the finished preparation may have some influence(11). The pH of the skin, since on the acid side, is referred to as the acid mantle of the skin. It varies in different parts of the body and on different individuals. Skin

specialists claim that the surface of a healthy skin has an acidic pH of 3 to 5, and an alkaline or neutral preparation may neutralize or break down the skin's natural protection against bacteria. Prolonged use of alkaline vehicles may have deleterious effects since many fungi and pathogenic bacteria are sensitive to acids, but grow abundantly in a slightly alkaline environment. Several investigators have claimed increasing effectiveness on the skin of medicaments like antibiotics, steroids, and silicones when introduced in an acid mantle base. There are still arguments pro and con concerning the idea that since the normal pH of the skin is slightly acidic, benefits may be derived from preparations having the same pH. Further observations must be carried on in this field to determine the usage value of buffered preparations as prophylactic and therapeutic adjuvants.

Sensitization

In the formulation of a dermatological preparation, or fundamentally, in the selection of a base, one of the most careful considertions is that of sensitization. These reactions can be mild in nature, perhaps a tingling or stinging effect, to those of some violence, accompanied by definite health hazards. We are familiar today with the reactions produced by most substances but new ones are coming along constantly, and, in addition, new combinations are being made which may perhaps be hazardous. At any rate, this factor cannot be overemphasized. Actually, there is probably no material to which some person is not sensitive and many substances are used as therapeutic agents which may sensitize one person and not another. However, we would like to review with you at this point a very interesting paper submitted by Underwood et al some years ago in connection with a study of agents used on the foot.(12)

"The human foot has become the target of unbelievable chemical abuse. Feet are seen daily, painted all the colors of the rainbow and daubed so thick with salves that removal with a tongue blade is necessary to view the underlying dermatitis. They buy them by the dozens; and so many of the chemicals are offenders that it is not the disease any more but simply irritation and dermatitis". They patch tested 400 dermatologic patients with the remedies applied before the initial visit. These included the assortments of tinctures, lotions, salves and powders. Without going into detail they list some 106 proprietary preparations and their chemical content. Positive reactions were obtained in 40% of the patients to one or more of the remedies used. The chemicals in the remedies the most frequent cause of dermatitis were mercury, phenol and ethylamino benzoate. The investigations disclosed that all mercurials should carry a "warning" on the label of the presence of a sensitizer. Lest an episode such as they portray occur again, it is urged that dermatologists take steps to prevent the commercial commandeering of scientific reports and formulas and to set up within the present organizations referees working with the Council to judge the maturity of new therapies and diagnostic procedures before they reach untrained hands and produce the treatment tragedies now so evident. What a challenge—the pharmacist sells these preparations daily. I feel he should be cognizant of these possibilities and can warn appropriately. It really is a serious matter.

Formulation

In considering the formulation of a dermatological preparation the factor of the pathological condition of the skin is of course most important; is it weeping or encrusted, dry and irritable, or greasy with blockage of the sebaceous ducts? Infection with microorganisms may be a prime cause of the condition or it may be a secondary complication, but in many cases, there is no significant infective agent at all. Van Abbe(8) submits a table illustrating the principles involved in the selection of dermatological bases to suit various pathological states of the skin. He indicates that just as the choice of the vehicle should be matched to the patient's skin condition, so should the mode of application be adjusted to suit the case. Too little attention is perhaps given to this aspect and the pharmacist seldom has enough background information to enable him to advise properly; for example, the patient should always be told whether to use an ointment with the cover of a dressing.

Skin Condition	Example	Type of Base to be Used	Effect
Inflamed, weeping, possibly blistered	Acute contact dermatitis	Aqueous lotion	Cooling, drying
Irritable, some weeping, encrusted, infected (?)	Sub-acute eczema	Oil-in-water emulsified cream	Soothing, facilitates action of antiseptics
Chronically irritable, dry	Chronic housewives' eczema	Emollient, non-aqueous e.g. greasy, paraffin type	Soothing, not drying washing off of ointment preferably avoided-acts as barrier against further irritation
Moist, macerated, infected (?)	Hyperhidrosis	Absorbent dusting powder	Promotes formation of normal epidermis and permits antiseptic action
Greasy with comedo formation	Acne vulgaris	Non-greasy, aqueous or alcoholic base (with keratolytics etc.)	Dries surface, promotes flow from sebaceous glands by aiding action of keratolytics
Dry, scaly (typical psoriatic)	Psoriasis	Stiff, greasy	Friction in application used for removal of scales

There are many pharmaceutical forms available for dermatological therapy—most of them we know a great deal about from our pharmacy training. Zopf (5) classifies them as follows: Ointments (creams, eye ointments, etc.); Pastes; Cerates; Plasters (medicated and supportive); Lotions (shake and emulsions); Powders, Paints (collodions, dermatologic varnishes); Glycerogelatins; Liniments; Tinctures; Poultices (cataplasms); Plasmas; Chemicals (direct application—caustics and escharotics; Wet dressings (solutions); Baths (cleansing and medicated—solutions). We cannot but touch on a few of these at this time.

Anhydrous, Greasy or Oleaginous Bases

Preparations of this nature have always since early times been constituted of animal or vegetable fats or waxes, and are inherently greasy. Lard and vegetable oils were particularly used but suffered from the disadvantage that rancidity and off-colour developed. New types of lard have been produced recently which are highly stable and we may see some return of its use. The oils are of course still widely used but more frequently in liquid medication where an emollient effect is desired. Greasy bases do not absorb moisture to any extent, mix poorly with aqueous or water solutions and generally leave a film of grease on the surface of the skin.

Fatty bases (11) and petrolatum, for many years, filled the bill as ideal bases. Soon, however, it was seen that they displayed characteristics that outweighed their advantages. In addition to those mentioned above they have a blanketing effect which prevents the escape of heat, pus, and moisture, thereby resulting in irritation, and they are difficult to remove by washing. They are still widely used as a bland base in which drugs are stable, and from which, according to some investigators, diffusion does take place. With most of these bases there is little cooling effect—(8) or even the reverse, but such bases are nevertheless soothing, especially on chronically inflamed skin. When deep (percutaneous) absorption of a medicament is desired, these bases may be suitable, since lipid-soluble substances are apparently carried down the sebaceous ducts surrounding the hair follicles. Anhydrous ointments give some protection against sources of further irritation (e.g. wind) and, when they are water-repellant, tend to reduce the de-greasing effect of over-zealous cleansing and to inhibit the action of water-soluble irritants.

Paraffins and waxes are the most common examples of the greasy type and it should be emphasized that some medicaments require this type of base for long-term stability. Penicillin and Bacitracin are examples of drugs that decompose in the presence of moisture and various other substances, and therefore should be formulated preferably in a non-aqueous base of the petrolatum type, whereby long shelf-life is secured. The pharmacist should always bear these stability considerations in mind but he is in a rather preferred position since most of the medication that he dispenses is for short term use and thus he is able to prepare various more elegant forms where stability for longer periods would be impaired.

The B.P. 1958 still retains Paraffin Ointment, Simple Ointment and Wool Alcohols Ointment.

Paraffin Ointment	
White Beeswax	20 g.
Hard Paraffin	30 g.
Cetostearyl Alcohol	50 g.
White Soft Paraffin or Yellow Soft Paraffin	900 g.

Simple Ointment	
Wool Fat	50 g.
Hard Paraffin	50 g.
Cetostearyl Alcohol	50 g.
White Soft Paraffin or Yellow Soft Paraffin	850 g.

Wool Alcohols Ointment	
Wool Alcohols	60 g.
Hard Paraffin	240 g.
White Soft Paraffin or Yellow Soft Paraffin	100 g.
Liquid Paraffin	600 g.

It will be observed that they are still more or less the anhydrous type but there is present Cetostearyl Alcohol in two of them, which is a mixture of solid aliphatic alcohols consisting chiefly of stearyl and cetyl alcohols, and which imparts smoothness to the ointment as well as the ability to take up water or aqueous materials when required. We will recall the ability of Wool Fat to take up water and form Lanolin — so also do the Wool Alcohols take up water to form water-in-oil preparations, which like lanolin are smooth, elegant, greasy creams. The Pharmacopoeia has included Oily Cream which consists of Wool Alcohols Ointment 500 g. and Purified Water 500 ml. Whenever we use wool fat or wool alcohols we are simply dealing with the fatty acid esters of cholesterol and oxycholesterol.

Paste forms are still used where a thickening and stiffening of the preparation is desired, that is, by raising the melting-range of the mixture and increasing viscosity. They are particularly useful for their "splinting effect" (8), immobilizing the skin area during treatment. It is a matter of some interest that Polano states that the dermatologist prescribes, or at least should prescribe, far more pastes than unguenta, and that a great many of the failures met with in general practice in the treatment of dermatoses are due to the indiscriminate prescription of unguenta and the neglect of pastes, should be taken into account (2). He feels that the advantage of pastes over ointments lies in the fact that pastes adhere better to the skin and do not hamper perspiration, and are therefore not liable to cause overheating of the skin. Pastes are a type of dermatological preparation that should often be used, in contrast to salves, for which they can almost be substituted. In easily irritated dermatoses, pastes can be used when the stage for wet dressings and cooling pastes is passed. A drawback is that they are still somewhat messy and often involve bandaging. However, I think we will all agree that they have received less attention recently, and perhaps as Polano suggests this should be rectified. Lassar's Paste and Unna's Pastes are old familiar examples. The B.P. 1958 records the following pastes:

Compound Zinc Paste

Zinc Oxide, finely sifted	250 g.
Starch finely sifted	250 g.
White Soft Paraffin	500 g.

Zinc and Salicylic Acid Paste (Lassar's)

Zinc Oxide finely sifted	240 g.
Salicylic Acid, finely sifted	20 g.
Starch, finely sifted	240 g.
White Soft Paraffin	500 g.

Zinc Oxide and Salicylic Acid Ointment C. F. (Modified Lassar's Paste)

Salicylic Acid, finely powdered	20 g.
Zinc Oxide	250 g.
Starch	250 g.
Cetyl Alcohol	18 g.
Stearyl Alcohol	18 g.
Castor Oil	94 g.
Glycerin	200 g.
Distilled Water	150 g.

G. C. WALKER.

(Part II of Dermatological Formulations will appear in the May issue of the Bulletin).

4-DAY O.C.P. SEMINAR
MAY 4, 5, 6, 7, 1959

Sponsored by the Ontario College of Pharmacy, supported by the Canadian Foundation for the Advancement of Pharmacy, with lecturers from the University of Toronto, Faculty of Pharmacy, Faculty of Dentistry and School of Hygiene.

A. – LECTURE SERIES

Monday, 9.30 a.m. and 8.00 p.m.

Recent Developments in (a) DIURETICS (b) ANTICOAGULANTS
Dr. G. R. Paterson, Associate Professor of Pharmaceutical Chemistry.

Monday, 11.00 a.m. and 9.30 p.m.

SOME PROBLEMS IN RETAIL PHARMACY MANAGEMENT.
Professor H. J. Fuller, Professor of Pharmacy Administration.

Tuesday, 9.30 a.m. and 8.00 p.m.

YOU AND YOUR HOSPITAL.
Mrs. I. E. Stauffer, Assistant Professor in Hospital Pharmacy.

Tuesday, 11.00 a.m. and 9.30 p.m.

CHEMOTHERAPY AND CANCER.
Dr. J. G. Nairn, Assistant Professor in Pharmacy.

Wednesday, 9.30 a.m. Only

DENTIFRICES, MOUTH WASHES, TOOTH BRUSHES—Present Status and Value.
Dr. C. H. M. Williams, Professor of Periodontology.

Wednesday, 11.00 a.m. Only

ORAL ANTIDIABETIC AGENTS.
Dr. A. M. Fisher, Associate Professor of Physiological Hygiene, Assistant Director, Connaught Medical Research Laboratories.

Thursday, 9.30 a.m. and 8.00 p.m.

(a) SIGNIFICANT DEVELOPMENTS IN CORTICOSTEROIDS.
(b) GRAPHIC OUTLINE OF IMPORTANT ANTIBIOTICS.
Dr. R. M. Baxter, Associate Professor of Pharmacognosy.

Thursday, 11.00 a.m. and 9.30 p.m.

DRUG THERAPY OF MENTAL DISORDERS.
Dr. F. W. Teare, Assistant Professor in Pharmaceutical Chemistry.

B. – SPECIAL LABORATORY SERIES

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